lodes with the sources of the placer gold. Moreover, many nuggets have been found adhering to quartz, so that the weight of evidence appears to be in favour of the view that the gold in these placers, at any rate, has been laid down there by mechanical rather than chemical processes.

The method of working the placers resembles that followed in the frozen placers in the Trans-Baikal in Eastern Siberia. Prospecting is done chiefly in the short summer when the snows are gone and water is plentiful, but the excavation of the gravel is best carried on in winter when nothing else can be done. The shafts are sunk to the pay dirt, and tunnels are then run through the gravel, following the rich material wherever it may be. To soften the ground a pile of wood is placed against the end of the drift and set on fire, the gravel, to the depth of about a foot, being brought down by pick and shovel after the fire has gone out. As M. Levat points out in speaking of the Siberian placers (*Eng. and Mng. Jour.*, June 12, 1897), the method is not an ideal one, but the circumstances are difficult. The frozen soil cannot be easily worked with the pick, as it does not break but simply mats together under a blow. For the same reason powder and dynamite have little effect; moreover, the drilling of the alluvium through which quartz boulders are scattered is a slow and costly work. The gravel is piled up to await the arrival of spring, when it is washed in the cradle or in short sluices, which are expensive owing to the high cost of timber.

The future of the country can hardly be foreseen as yet. It is certain that next year hundreds of miles of unworked creek beds will be vigorously prospected by the thousands who will enter and find that all the ground on the tributaries of the Klondike is already occupied. If, as seems likely, other fairly rich placers are found, many of the men will remain in the country, and with the development of the auriferous quartz lodes and the beds of lignite, some of which have already been discovered, the Yukon district of Canada will probably become one of the steady producers of gold like California or Colorado. The output this year will probably not greatly exceed 800,000*l.*, partly owing to the scarcity of water in the creeks this summer, which has interfered with the washing in the creeks. Nevertheless, the Canadian production of gold for 1897 will with this addition be raised to over 1,000,000*l.*, or considerably above that of 1863, which amounted to 860,000*l.*, and is still the highest on record. There is little doubt that this will be largely augmented in the next few years, and that the Yukon district will be the richest Canadian gold-field yet discovered.

T. K. ROSE.

NOTES.

THE International Congress of Zoology is to meet in Cambridge on August 23, 1898, and a general committee has been formed to make arrangements for its reception. The President-elect (Sir William Flower) has summoned a meeting of the committee, to be held at the rooms of the Zoological Society, 3 Hanover Square, W., at 2.30 p.m. on Thursday, November 4; and special notices have been addressed to those who have expressed their willingness to act as members of the committee. Zoologists who have not been asked to join the committee are requested to communicate with the Local Secretaries (International Congress of Zoology), The Museums, Cambridge.

H.M. THE KING OF BELGIUM has conferred upon Prof. D. E. Hughes, F.R.S., the decoration of Officier de l'Ordre Leopold. This mark of appreciation is due to Prof. Hughes' work in connection with his printing telegraph instrument, which the Belgian Government have largely used during the last twenty-seven years. The Belgian Minister of Railways, Posts and Telegraphs has telegraphed to Prof. Hughes the congratulations of the telegraphic service upon the distinction conferred upon him.

AT a meeting of the Royal College of Physicians of London last week, the Moxon medal was awarded to the President, Sir Samuel Wilks, Bart.; and the Weber-Parkes prize of 150 guineas and a silver medal to Dr. Arthur Ransome for the best essay on consumption and its treatment. A similar medal, called the second medal, was awarded to Dr. Peter Paterson, of Glasgow. The Baly medal was awarded to Prof. Schäfer, of University College. This medal is given every third year to the person who has distinguished himself the most in physiology during that interval.

THE Reale Accademia dei Lincei has recently elected the following associates and correspondents:—National associate, in the section of zoology and morphology, Prof. G. B. Grassi; correspondent, in the same section, Prof. G. Fano; foreign associates in mathematics, Profs. H. Weber and T. Reye; in mechanics, Prof. G. H. Darwin; in mathematical and physical geography, Prof. F. R. Helmert; in geology and palæontology, Prof. A. Gaudry; in physiology, Profs. H. Kronecker and O. Schmiedeberg.

WE print in another part of this number an abridgment of a report drawn up by a deputation appointed by the Manchester Technical Instruction Committee to visit technical schools, institutions, and museums in Germany and Austria last July and August. This is the second time Manchester has delegated some of its educational advisers to see what foreign countries have done and are doing to establish an efficient system of scientific and technical education. The recent visit showed the deputation that since 1891 there has been a considerable development throughout Germany of educational means and resources. The technical education movement in England during the past five or six years has not gone unnoticed in Germany, and the effect has been the extension and improvement of facilities for imparting instruction of a scientific and technical character, the evident determination of Germany being to maintain the lead in higher scientific education. It is satisfactory to know that the educational authorities of some of our cities are also alive to the importance of scientific instruction as an aid to the development of our commerce and industries. When a deputation from an industrial city like Manchester speaks of continental schools and methods in the glowing terms of the report abridged this week, and urges the extension of higher scientific instruction as the force which will enable us to keep our place among the nations, it is time to give thanks that the eyes of leaders of industry have been opened, so that the intimate connection between science and commerce can be clearly seen. The discussion which took place at the Manchester City Council upon the report of the deputation, fully bears out the views expressed by Dr. Armstrong in his recent articles in NATURE on the need of organising scientific opinion (vol. lv. pp. 409, 433). Moreover, it shows that a large number of manufacturers are well able to understand that the reason for the prominence of some of the continental Powers lies in the educational system. It is evident that the report has given Manchester people a clear view of the direction in which advance should be made, and doubtless they will profit by it. Other municipal authorities would do well to send their wise men into the Fatherland for the lessons to be learned if they wish to make industrial progress.

PROF. G. H. DARWIN has gone to the United States to give a course of ten lectures on "Tides" at the Lowell Institute.

A SEA-FISHERIES exhibition, arranged to illustrate the fishing industries and the application of science to agriculture, will be opened in the Museum of Zoology, University College, Liverpool, to-morrow, by Mr. John Fell, chairman of the Lancashire Sea-Fisheries Committee.

PROF. F. OMORI, of the Seismological Institute, Tōkiō, is now in India, for the purpose of investigating the recent Calcutta earthquake, and reporting on the same to the Japanese Government.

THE Departmental Committee recently appointed to consider and report upon the desirability of establishing a National Physical Laboratory, and the functions which such an institution would perform, has just commenced its sittings.

WITH the last issue of our contemporary *The Electrician*, Mr. Bond's nine and a half years' connection with that journal ceased. Mr. W. G. Bond joined the editorial staff in April 1888, and was appointed editor in April 1895, upon the retirement of Mr. Alex. P. Trotter.

THE United States Board of Geographical Nomenclature have lately come to the following decisions about the orthography of some names brought into prominence through the Klondike gold discoveries :—Klondike will be spelt this way and not Clondyke or Klondyke, Lake Lebarge is adopted instead of Lake Labarge, Lake Lindeman instead of Lake Lindemann or Linderman, the Lewes river and not the Lewis river, and Taiya instead of Dyea, to denote the inlet, river, and village at the head of the Lynn Canal.

WE regret to receive confirmation of the report, already referred to, that Dr. J. Hann, Director of the Austrian Meteorological Service, has resigned that arduous position, from considerations of health, and has been appointed by the Minister of Instruction, &c., to the Professorship of Meteorology at the University of Graz. We have very frequently had occasion to notice Dr. Hann's valuable labours in our columns, and we may hope that now he is relieved from the onerous routine duties of such a large organisation he may be able to continue his studies for the benefit of meteorological science. His place in Vienna will be worthily filled by Dr. J. M. Pernter, late Professor of Meteorology at Innsbrück University, and the author of several meteorological publications.

THE Paris correspondent of the *Times* states that the value of the collections bequeathed by the late Duc d'Aumale to the Institute of France is officially reported to be 15,000,000 francs. Of this sum, 1,500,000 francs represents the additions made by the Duke subsequent to his deed of gift. The library alone, with its 28,000 volumes and 1400 manuscripts, is worth 5,000,000 francs. The receipts from lands, fisheries, timber, &c., are estimated at 400,000 francs per annum, which will leave a surplus of 40,000 francs over the outgoings. Annuities, moreover, to the Crédit-Foncier, now amounting to 86,000 francs, will expire in 1934. The Institute will enter next spring into possession of this princely bequest.

THE Duchess of Portland, president of the Society for the Protection of Birds, has written a special letter of appeal for increased funds to enable the Society to establish a small permanent office in London. More annual subscribers are wanted, and as an inducement it is proposed to designate as Fellows all who subscribe not less than one guinea per annum.

A GREAT physiologist, Dr. Rudolf Heidenhain, professor of physiology in the University of Breslau, has just passed away. From a notice of his life and work in the *British Medical Journal*, we derive the following particulars of his career :—Heidenhain was born in Marienwerder on January 29, 1834, and was thus just over sixty-three years of age at his death. He studied medicine at Berlin, Königsberg, and Halle. In Berlin he attended the lectures of Du Bois-Reymond, and in Halle those of F. W. Volkmann. He graduated at Berlin in 1854, and in 1859 he was called to the chair of Physiology and Histology in Breslau, a post which he held throughout his life. The early fruits of his labours and that of his pupils in Breslau appeared in his "Studien des physiologischen Institutes zu Breslau," in four volumes, from 1861 to 1868. Before that time, however, he had published his "Physiologische Studien" (1856). The first volume of "Pflüger's Archiv für d. gesammte Physiologie" appeared in 1868. In this "Archiv," from the second volume onwards, we have numerous papers from his laboratory, by himself, by his pupils, and by his assistants, including such diverse topics as the influence of the nervous system on temperature, metabolism in muscle, arhythmical activity of the heart, action of drugs on the nerves of the submaxillary gland, for example, atropine, calabar bean, nicotin, digitalin ; his histological observations on the structure of the pancreas, wherein he showed the changes in gland cells that accompany secretion ; the action of stimulation of sensory nerves on blood pressure, both by himself and in conjunction with his pupil Grützner, now professor of physiology in Tübingen ; spinal reflexes ; the innervation of blood vessels, a continuation of Ostroumoff's work on the same subject. In 1883 appeared his essay, "Physiologie der Absonderungsvorgänge," in vol. v. of Hermann's "Handbuch d. Physiologie." This is still a standard essay on this subject, and it contains an account of his researches on the salivary, pancreatic, gastric, and other glands. The whole series extends to over four hundred pages. His results are incorporated in every text-book on physiology. These essays record a masterly array of work dealing both with the physiological and the histological aspects of the question, and there stands out the pre-eminent fact that in all glands secretion is accompanied by characteristic structural changes. In later years came his now well-known researches on lymph formation, in which he attributed such great importance to the activity of the capillary wall as secretory organs. From his laboratory have appeared that long and important series of studies on hæmodynamics, by his assistant, K. Hürthle, while from the chemical department under Prof. Rohmann has come a whole series of important memoirs, many of them dealing with ferment action, which at present is attracting so much attention. Throughout the whole of Heidenhain's researches we have exemplified the value of conjoint histological, chemical, and more purely physiological work, the one serving to elucidate the other. Heidenhain was an admirable example of an "all-round" physiologist who did not work in a limited groove, but had a wide and comprehensive grasp of his subject, and, directly by his own work and indirectly by that of his pupils, added innumerable stones to the stately building of physiological science.

MANY of the scientific societies commence the new session next week. On November 2, a short address will be given at the Institution of Civil Engineers by Sir J. Wolfe Barry, K.C.B., F.R.S., and the medals and prizes awarded by the Council will be presented.—A meeting of the Institution of Mechanical Engineers will be held on November 3 and 4. The chair will be taken by the President, Mr. E. Windsor Richards, at 7.30 p.m. on each evening. The following papers will be read and discussed, as far as time permits : Experiments upon propeller ventilating fans, and upon the electric motor driving them, by Mr. W. G. Walker ; diagram accounts for engineering work, by Mr. John Jameson ; mechanical features of electric traction, by Mr. Philip Dawson.—The Chemical Society meets on November 4, when papers by Profs. Moissan and Dewar will be read (see p. 596).—The Society of Chemical Industry will meet on November 1, and papers will be read on (1) the adulteration of Portland cement, by Messrs. W. H. Stanger and Bertram Blount ; (2) an improved adjustable drip proof Bunsen, by Dr.

W. P. Evans.—The first meeting of the Linnean Society for the new session will take place on November 4. Papers will be read by the Right Hon. Sir John Lubbock, Bart, F.R.S., on the attraction of flowers for insects; and by Mr. W. C. Worsdell, on transfusion-tissue, its origin and function in the leaves of gymnospermous plants; Mr. F. G. Jackson will show some zoological and botanical exhibits collected by the Jackson-Harmsworth Polar Expedition; and Mr. Reginald Lodge will exhibit lantern-slides of marsh-birds and their nests, from photographs recently taken in Spain and Holland.—The Geologists' Association will hold a conversazione at University College on Friday, November 5, when a number of interesting objects will be exhibited by some of the members.—The opening meeting of the new session of the Röntgen Society will be held at St. Martin's Town Hall on November 5. Prof. Sylvanus Thompson will deliver the presidential address.

THE new session of the Royal Geographical Society will open on November 8 with a brief introductory address by the President, and a paper on the Jackson-Harmsworth Arctic Expedition, by Mr. Frederick J. Jackson. On November 22 Dr. Sven Hedin will give an account of four years' exploration in Central Asia. Other papers which may be expected during the session are the following:—Exploration in Spitsbergen, 1897, by Sir W. Martin Conway; exploration in the Chilian Andes, by Mr. E. A. FitzGerald; explorations in Greenland, by Lieut. Peary; researches in the Scottish Lakes, by Dr. John Murray, F.R.S.; the Eastern Malay Provinces of Siam, by Mr. H. Warrington Smyth; a trip in Northern Somaliland, by Mr. F. B. Parkinson and Lieut. Brander-Dunbar. During the session it is probable that a special meeting will be held in connection with the 400th anniversary of the discovery of the Cape route to India by Vasco da Gama. Under the joint auspices of the Society and the London University Extension Committee, Mr. H. J. Mackinder is giving a course of twenty-five lectures on the geography of Britain and the British Seas, at Gresham College, Basinghall Street, E.C. It is probable that arrangements will be made for two Christmas lectures to young people, by Dr. H. R. Mill.

ON the 17th, 18th and 19th inst., the Liége Association of Engineers, a society composed exclusively of graduates of the Liége School of Mines, celebrated its fiftieth anniversary. Six hundred members took part in the celebration, as well as delegates bearing addresses of congratulation from the Iron and Steel Institute, the French Society of Engineers, the German Ironmasters' Association, and numerous other continental technical societies. The guests were received by Mr. R. Paquot, the President, who was one of the founders of the Association. After a brief presidential address, Prof. A. Habets, the indefatigable secretary, read a paper summarising the history of the first fifty years of the Association. The meeting was then divided into two sections, one dealing with mining and the other with metallurgy. In the former the following papers were read: (1) The development of the mining industry of Belgium since 1831, by Mr. E. Harzé; (2) a contribution to the geology of the Charleroi district, by Mr. J. Smeysters; (3) winding from great depths at the Harpen Collieries, by Mr. E. Tomson; (4) the economy due to steam compression, by Mr. V. Dwelshauvers-Dery and Mr. E. Hubert; and (5) continuous breaks, by Mr. A. Kapteyn. In the metallurgical section the papers dealt with were: (1) a study of the blast-furnace, by Mr. G. Rocour; (2) the progress accomplished in the knowledge of steel, by Mr. A. Greiner, of the Cockerill Company; (3) the direct utilisation of the gas of blast-furnace for the production of motive power; and (4) notes on steel, by Mr. J. Magery, of Aix-la-Chapelle. In the evening a banquet was held at the Royal Conservatoire, at which the Belgian Minister of Public Works and the Minister of Foreign Affairs were present. October 18 was devoted to excursions to Cockerill's Works, to the Small Arms Factory at Herstal, and to the University laboratories, a concert being held in the evening. October 19 was devoted to a visit to the Brussels Exhibition, where a farewell luncheon was held.

IN view of assertions which have been published, with some appearance of authority, as to the efficacy of sanitation as a substitute for vaccination in dealing with small-pox, the following opinions, from a declaration, signed by upwards of 850 medical officers of health in Great Britain, India, and the Colonies, and issued by the Jenner Society, are worth putting on record: (1) As responsible sanitary officials, to whom the care of the health and lives of the community is especially entrusted, we have every inducement to give due weight to the value of "sanitation" in the widest sense of the term for the prevention of small-pox as of other forms of infectious disease. We include in that term good drainage, the removal of refuse, the supply of pure air and water, and all other conditions which are calculated to fortify the body against disease in general. (2) We are no less alive to the importance of those special precautionary measures which experience has shown to be so valuable, when effectively used, to arrest the spread of infectious disease, such as the immediate notification of illness, the efficient isolation of the sick and of those who have been exposed to infection, and thorough disinfection of persons and things. (3) While thus fully appreciating the value of these agencies for such purposes, we unhesitatingly declare our belief that they cannot alone be relied on either to prevent or to stamp out epidemics of small-pox. (4) We believe that the only trustworthy protection at present known against small-pox, alike for the individual and the community, is efficient vaccination in infancy and subsequent re-vaccination, and that the only effective way of stamping out epidemics of this disease lies in the free use of these agencies.

WHETHER X-rays exist in the kathodic pencil which produces them is a question that forms the subject of some interesting experiments at the hands of Prof. A. Ròiti (*Atti dei Lincei*, vi. 5). To put the matter briefly, a discharge-tube was closed at one end by a plate of aluminium covered by a diaphragm of lead with a central aperture, in such a way that when kathodic rays fell on the central portion, the X-rays given off illuminated an actinometer. On placing the tube in the field of a powerful magnet, so as to deflect the kathodic rays to one side, the actinometer appeared almost dark. By inserting a tube of lead *inside* the discharge tube, so as to prevent any reflected rays from the side of the tube from reaching the central portion of the aluminium, complete extinction of the X-rays was obtained. The author concludes that indeflectable kathodic rays either are non-existent, or else, if they exist, are not transformable into Röntgen rays. Prof. Ròiti also describes experiments establishing the law that metals of greatest atomic weight emit rays of greatest intensity.

THE Commission appointed to inquire into the practicability of effecting electrical communication between light-houses and light-vessels and the shore, have issued their fifth and final report. They state that the system which has been in use for connecting the *Sunk* light-vessel with the shore is the best system of continuous connection which has been brought to their notice, but they do not consider it as affording an entirely satisfactory solution of the difficulty of maintaining in an efficient manner, and at a reasonable cost, electrical communication with light-vessels anchored in deep water and in exposed positions. Attention has been directed to the method of signalling without wires on the system used by Signor Marconi, but the Commissioners have not thought it desirable to make any definite recommendations as to this until further light has been thrown on the matter by the investigations now being conducted by the Post Office. Experiments which have been made at the instigation of the Commissioners proved satisfactory, communication having been obtained without the aid of intermediate wires between two points on either side of the Bristol Channel, distant about nine miles from one another, and it has further been arranged for a practical trial of the system at a light-vessel.

In the *Journal de Physique* for October, M. Henri Becquerel's explanation of the experiments of M. Le Bon on the so-called black light (*lumière noire*) is given. M. Becquerel finds that all the observed phenomena can be attributed to the action of ordinary red and infra-red rays. Not only is ebonite transparent to such rays, but they possess the property of extinguishing the phosphorescence of sulphide of zinc, and of acting on a slightly "fogged" photographic film in exactly the manner observed by Le Bon. Moreover, when the ebonite is replaced by a sheet of red glass the same phenomena are observed.

We have received the first number of a new series of the "Publications of the University of Pennsylvania" devoted to mathematics. It contains "Contributions to the Geometry of the Triangle," by Robert Judson Aley, and "Properties of the Locus r = constant in Space of n Dimensions" by Paul Renno Heyl. In the latter, the author finds expressions for the measure of the content of the locus of the extremity of unit radius vector, and arrives at the result that this content is a maximum in the case of five-dimension space. A corresponding maximum is also shown to exist for the measure of boundary of the same locus.

The Corporation of Bristol, as owners of the port and docks built at Bristol and at Avonmouth and Portishead, are making great efforts to draw to the port some of the enormous trade which is now carried on between this country and the United States and Canada. At one time the port of Bristol stood first as the great centre for all the trade with the countries on the other side of the Atlantic, but gradually as the size of vessels increased, and as other ports improved their shipping facilities while Bristol practically stood still, the trade was directed principally to Liverpool, and more recently also largely to Southampton. However, owing to improvements which have been carried out at Avonmouth, a large firm of shippers have now commenced to run a regular line of steamers between Canada and Bristol, and cargoes of 8000 tons of miscellaneous merchandise have been quickly and efficiently discharged at the Avonmouth Dock. To further foster and secure this growing trade, the Corporation have recently decided to apply to Parliament for power to expend a million and a half of money in building a new and enlarged dock of 40 acres, which is to have an entrance lock 850 feet long, capable of receiving the largest steamers at present likely to be built.

Among various important articles in the *Annalen der Hydrographie und maritimen Meteorologie* for September, there is one of special interest, by Dr. G. Schott, on the fogs of the Newfoundland Banks. Fogs are prevalent in various parts of the world, but there is no district in which navigation is endangered in a similar way by the combination of icebergs and fog. The author has shown the distribution of fog upon twelve monthly charts, compiled from all the materials collected by the Deutsche Seewarte, for the routes of steam vessels between New York and 40° west longitude. The charts show that the period of most copious fog is from April to August inclusive; in September there is a sudden and considerable decrease, while February has the least amount. There are two regions in the district under consideration which have the greatest frequency of fog, viz. south of Nova Scotia and the eastern part of the Great Newfoundland Bank. On the Bank itself, especially on the western side, the frequency of fog is much less, owing to the water being considerably warmer there than on the eastern side, and because the sudden changes of the sea temperature do not occur there to the same extent as on the eastern side, where the two currents come into contact.

A suggestive paper by Prof. W. P. Mason, entitled "Sanitary Problems connected with Municipal Water Supply," has been published in the *Journal* of the Franklin Institute. Some interesting facts are recorded concerning the health of some American cities in relation to typhoid fever and water supply. The writer tells us that the average annual typhoid death rates for thirteen Massachusetts cities before the introduction of a public water supply was 7·94 per 10,000, whilst since the improvements have been carried out the deaths from typhoid fever have fallen to 3·83 per 10,000. In the whole State of Connecticut the percentage of typhoid deaths to total deaths has fallen from about 5·8 in 1870 to 1·84 in 1893. But although much advance has been made in the improvement and protection of American public water supplies, a great deal remains yet to be done. A source of pollution too often overlooked is the contamination of water in the pastures through which it passes. Mason cites an instance which came under his notice of twenty-six cows in a pasture through which ran the open watercourse connecting the storage and distributing reservoirs of a city. The animals had perfect freedom to wade in the stream to within a few yards of the point where the water entered the city mains. A very remarkable example of how typhoid fever may be spread is given in the case of a serious outbreak of this disease which took place at Plymouth, Pa. The origin of this disastrous epidemic was traced to a single typhoid patient whose dejecta were thrown out upon the snow of a frozen hillside, at the base of which ran a small stream, whence the town water supply was ultimately drawn. Several weeks elapsed, during which the dejecta were hard frozen before the March thaws permitted the melting snows to wash them into the stream below; but during this interval the typhoid germs had retained their vitality and full complement of virulence, as demonstrated by the otherwise quite unaccountable outbreak of typhoid fever in the said town. Various investigators have shown that typhoid bacteria can stand being frozen; indeed, it has been found that three months' continuous freezing does not destroy these germs.

A Louisiana Society of Naturalists has been established, with about forty-five members. The Secretary is Mr. E. Foster, of New Orleans.

A. Vierkandt gives in *Globus* (Band lxxii. p. 133) a long and illustrated account of Ehrenreich's "Anthropologische Studien über die Urbewohner Brasiliens." The evidence seems to these authors to show that the American Indians are a distinct race of mankind, and not a branch of the Mongolian race.

The primitive inhabitants of India in their ethnological, religious and linguistic aspects, is the subject of two illustrated articles in *Globus* (Band lxxii. p. 53, 77), by Prof. Gustav Oppert. This is a preliminary sketch of a memoir that the author is preparing, and which promises to be of considerable importance.

In a collection of fifteen skulls from the Papuan Gulf, Dr. G. A. Dorsey (*Dental Review*, Chicago, vol. xi.) finds three examples of suppressed third molars and two examples of supernumerary pre-molars. The occurrence of the latter looks like an atavism, while the absence of the wisdom-tooth is generally regarded as due to a reduction of the jaw, and therefore, to a certain extent, is a result of civilised or cultural habits.

THE affinities of the Hovas of Madagascar have often been discussed. A recent paper by Mr. Duckworth (*Journ. Anth. Inst.*, 1897, p. 285) gives occasion to Zaborowski (*Bull. Soc. Anthrop.*, viii. p. 84) to review this problem; he points out various difficulties in deriving the Hovas from a pure Malay stock, and draws attention to numerous resemblances with the Nias. The latter are by no means pure Battaks, and Modigliani believes in an Indian influence. Zaborowski endeavours to show that this is largely Dravidian (rather than Aryan), and hints that this is also indirectly felt among the Hovas.

DURING next month the following science lectures will be delivered at the Royal Victoria Hall, Waterloo Bridge Road, on Tuesday evenings:—November 2, "Across Spitsbergen," Dr. J. W. Gregory; November 9, "Impressions of Canada," Prof. Beare; November 16, "Indian Meal and English Yeast," Mr. J. A. Baines; November 23, "The Gas Helium, and how it was discovered," Prof. Ramsay, F.R.S.; November 30, "Speech," Dr. B. L. Abrahams.

THE additions to the Zoological Society's Gardens during the past week include a Green Monkey (*Cercopithecus callitrichus*) from West Africa, presented by Miss A. E. Ard; a Vulpine Phalanger (*Trichosurus vulpecula*) from Australia, presented by Miss Shone; two Weka Rails (*Ocydromus australis*) from New Zealand, presented by Mr. Forbes White; a Cardinal Grosbeak (*Cardinalis virginianus*) from North America, presented by Mr. Aitchinson; a Vervet Monkey (*Cercopithecus lalandii*) from South Africa, a Crowned Lemur (*Lemur coronatus*), a Grey Lemur (*Hapalemur griseus*) from Madagascar, a Diademed Amazon (*Chrysotis diademata*) from South America, deposited; two Trumpeter Swans (*Cygnus buccinator*) from North America, a Crested Grebe (*Podiceps cristatus*), European, purchased; a Wapiti Deer (*Cervus canadensis*), born in the Gardens.

OUR ASTRONOMICAL COLUMN.

STARS IN THE LARGE MAGELLANIC CLOUD.—The Henry Draper Memorial has been the means by which it has been ascertained that the spectra of those stars belonging to Pickering's fifth type, and consisting mainly of bright lines, have hitherto been found only near the central line of the Milky Way. Out of the sixty-seven stars which come under this category, their mean deviation from this line amounts to the remarkably small angle of 2° 39′, while only one object deviates more than 9°. Prof. Pickering now points out that the two Magellanic clouds closely resemble the Milky Way in appearance, although both are detached from it and distant from the central line above mentioned by about 30° and 45°. A recent examination, by Mrs. Fleming, of the spectra of the stars in the large cloud (*Harvard College Circular*, No. 19), obtained by means of the Bruce photographic telescope, has shown that six stars have been discovered whose spectra are of the fifth type; further, that in seven stars of Pickering's first type, bright hydrogen lines are present, while the spectra of six known nebulæ are gaseous and not continuous. The *Circular* gives a list of the positions of these objects, but their declinations are too far south to be worth repeating here. It is interesting to note that Dr. Stewart in Peru independently observed the presence of bright lines in twelve of these objects, and communicated his results to Prof. Pickering while the *Circular* was in preparation.

THE PHOTOGRAPHY OF DELICATE CELESTIAL PHENOMENA.—Will one ever be able to satisfactorily record the details on planetary discs by the aid of photography? Dr. T. J. J. See says an emphatic No, while Prof. F. L. O. Wadsworth says very probably Yes. The former, writing in the *Astr. Nachr.* (No. 3449), bases his answer on the effect of the motion of the air, which shifts at insensible intervals the positions of the images by measurable quantities. By uninterrupted observation the eye becomes capable of detecting very delicate phenomena at the occasional moments of good seeing, and the mind, without any special effort, "readily determines what is permanent and what is transient." The photographic plate has a cumulative power, and the partial images are superposed with the result that the developed plate is impressed with an enlarged and blurred image, which gives nothing but the average result for the whole time of exposure. Further, Dr. See points out that small details cannot be photographically recorded because, even if there were no spreading of the light on the plate, no bodily motion of the whole image, and the motion of the telescope were perfect, phenomena smaller than 0″·5 could not be recorded. Thus, he says, "it does not seem possible that anything requiring even a moderate exposure could be detected in a luminous field (where the contrast is very great) when the diameter of the image is less than 1″."

Prof. Wadsworth (*Astronomical Journal*, No. 414) thinks, on the other hand, that photography up to the present time has failed only because the particular ways in which it has been applied have not been perhaps the best to secure the most satisfactory results. "There seems to be no good reason why we should not, under proper conditions, photograph all or even more (on account of greater resolving power and greater light action) than we can ever be sure we really see (up to a certain size of aperture not greater than 12 to 15 inches) on a planetary surface." The unsteadiness of the image during exposure, which is the main difficulty, he proposes to practically eliminate by mounting the photographic and the observing telescope on the same stand, and exposing the plate only for those intervals when the seeing is the best and the image steady. As Prof. Wadsworth is engaged in experiments in this direction, it would be perhaps more satisfactory to await his results. The problem is, however, of great interest and well worth solving.

COMET PERRINE, OCTOBER 16.—From Kiel we have received a *Centralstelle Circular* (No. 1), in which we are informed that Prof. Schaeberle has telegraphed the elements and ephemeris computed by Messrs. Hussey and Aitken from observations made on October 16, 17 and 18. A later *Circular* (No. 2) gives us the elements and ephemeris as calculated by Prof. H. Kreutz and Herr Möller from the observations made on October 16, 18 and 20. Below we give the two sets of elements mentioned above, together with the ephemeris printed in the second *Circular*:—

Elements.

T = 1897 Dec. 9·23 G.M T.	T = 1897 Dec. 7·799 Berlin M.T.
ϖ = 66° 28′ } 1897·0	ϖ = 65° 4′·2 } 1897·0
☊ = 32 5 } 1897·0	☊ = 31 57·9 } 1897·0
i = 69 38 } 1897·0	i = 69 26·5 } 1897·0
log q = 1·3525	log q = 0·13440

Ephemeris for 12h. Berlin M.T.

1897.	R.A. h. m. s.	Decl. ° ′	log r.	log Δ.	Br.
Oct. 28	0 5 20	+81 24·7	0·1716	9·9072	1·1
29	23 23 35	81 41·0	1700	9093	1·1
30	22 41 27	81 40·1	1683	9116	1·1
31	22 1 40	81 22·7	1667	9141	1·1
Nov. 1	21 26 4	80 51·6	1652	9170	1·1
2	20 55 44	80 9·5	1636	9201	1·1
3	20 30 21	79 19·7	1621	9234	1·1
4	20 9 25	78 24·3	1606	9270	1·1
5	19 52 8	77 25·3	1592	9307	1·0
6	19 37 51	+76 24·2	0·1577	9·9346	1·0

The comet's position is now very favourable for observation, lying to the north of the constellation of Cepheus, passing on October 29 between γ Cephei and the Pole Star; its distance from the former of these being equal to about a quarter of the distance between the two stars.

DR. B. ENGELHARDT'S OBSERVATORY.—We notice in the current number of the *Astronomische Nachrichten* (No. 3450) that, through age and ill-health, Dr. Engelhardt is compelled to discontinue his astronomical labours, and has given up his observatory at Dresden. He has presented all the instruments and the library to the Russian Royal University Observatory at Kasan.